

AGRICULTURAL NEWS LETTER

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This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the Du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.



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AGRICULTURAL NEWS LETTER

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The AGRICULTURAL NEWS LETTER serves as a medium of reporting new developments and new ideas in the field of agriculture, particularly as they are related to advancements through research. Material appearing herein may be reprinted in whole or in part, in the interest of advancing the general knowledge of new agricultural practices.

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WHAT FARM EDITORS ARE SAYING --

"There is no sign, so far, that farm efficiency is 'coasting.' In the last 25 years the cost of farm production has dropped about 30 per cent. The average yield per acre since 1935 has increased about 50 per cent." -- Jack Pickett in CALIFORNIA FARMER

"The fruit grower should be thankful that his needs are taken care of so adequately by modern spray manufacturing companies operating in a relatively free and unfettered economic system." -- Richard Meister in AMERICAN FRUIT GROWER

"Many an argument is sound -- just sound, nothing else." -- George Lee in DAIRYMEN'S LEAGUE NEWS

"Economics is a hard taskmaster. In good times we are tempted to mine the land to improve our standard of living and keep up with the Joneses. In bad times we feel we can't afford to give back to the land what we took away in good times...The soil builder seldom goes hungry, nor do his children lack for shoes and education. The land has a way of taking good care of those who take good care of it." -- Paul Johnson in PRAIRIE FARMER

"The most optimistic thing is population increase. Babies are all milk customers and there are 7,000 new ones every morning. Most of us will see the time when milk shortages take the place of present surpluses." -- WISCONSIN AGRICULTURIST AND FARMER

"As long as we grow crops we will have insects to plague us. The next time you start up your sprayer or duster with assurance that insect pests of the particular crop you are growing can be held in check, remember the entomologist and his expert guidance." -- AMERICAN VEGETABLE GROWER



"Farmers produce so abundantly that 85% of the population can now choose other kinds of jobs. If farmers were not so efficient, a lot more people would have to go to work farming. This is an efficiency that since before the war has increased farm output by about 40%, and does it with 17% less labor." -- Wheeler McMillen in FARM JOURNAL

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WATER FLOWS BETTER IN DITCHES FREE OF WEEDS

Chemical weed control in ditches has important advantages. There are great savings in labor, and weeds can be cleared without changing the elevation and slope of the ditch. Shovel-and-scrape weed removal may cut away enough soil to affect the flow of water.

A rank growth of weeds in waterways not only obstructs the flow of water, but may also cause build-up along banks, reducing the capacity of the ditch or canal. In irrigation systems, weeds also demand soil moisture themselves, and may cause a serious water loss, as well as being a source from which cultivated land may be weed infested.

In sprinkler irrigation, weeds often flourish along the pipelines, where it may be impossible to mow or cultivate.

Chemical weed control under these high-moisture conditions demands a compound that will not leach away before it does its job. In addition, of course, it must be applied in such a way that it does not endanger cropland. Low toxicity to people and animals is also highly desirable.

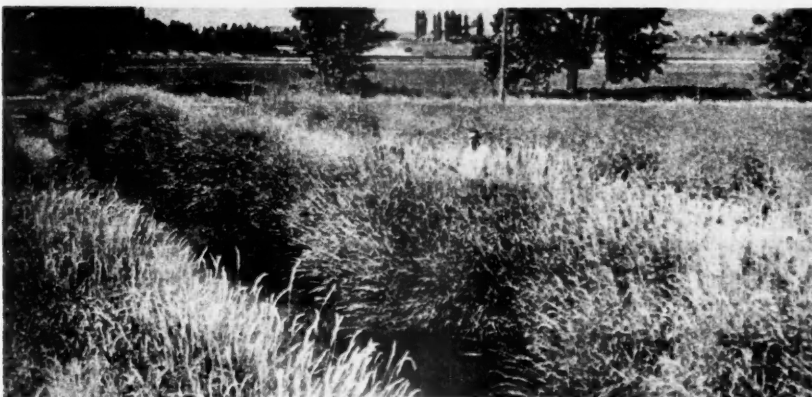
One of the new substituted urea compounds, "Karmex" W herbicide, seems to meet these requirements, and methods for using it in irrigation and drainage systems are being worked out by investigators in several western states. At rates of 40 to 80 pounds per acre, this material is now being used in irrigation districts, drainage districts, and on farms and ranches to control weeds in ditches and canals, and along pipelines.

"Karmex" W herbicide is a powder to be mixed with water. It may be used any time of year, provided there is enough moisture, either from rainfall or artificial means, to carry the chemical into the root zone of the plant. Best results are obtained if the chemical is applied during rainy seasons, shortly before plant growth begins. Matted vegetation on the ground should be removed before spraying. If dense growth is present, it should be mowed or cut first.

For irrigation ditches, "Karmex" W should be applied during the non-crop season, when the ditch is not in use. It must be fixed in the soil by moisture, to minimize movement and avoid crop injury. If rainfall has not totaled at least four inches before the ditch is used, it should be filled, allowed to stand for 72 hours and then drained. This waste water should not be used for irrigation.

The same principles apply when treating drainage ditches. "Karmex" W should not be applied where there is any danger of drainage water carrying the chemical to cropland, or other areas where it could affect desirable plants.

This herbicide should be used carefully. It should not be



A rank growth of canary grass uses excessive quantities of water, builds berms into the canal, and lodges in the canal to obstruct the flow of water. (Utah State Agricultural College photo)



Chemicals can be used to clear weeds out of ditches like this one along a roadside in Grant's Pass, Oregon. Type of vegetation which has been eliminated can be seen along the fence line in the right-hand background of the picture.



This Florida drainage ditch was scraped and then treated with chemical weed killer in December, 1953. No regrowth had started when the picture was taken in April, 1954.



Weed control along an irrigation pipeline on a vegetable farm in Massachusetts. With this area cleared of vegetation, the handling of the pipe is speeded up.

applied to areas into which roots of trees or other desirable plants may extend. It should not be used on lawns, walks, driveways, tennis courts, or similar areas, or in other locations where it may be washed or moved into contact with roots of valuable plants.

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Editor's Note: At dosages of one to six pounds per acre, "Karmex" W herbicide is being recommended for selective weed control in asparagus, sugar cane and pineapple. A close relative, "Karmex" DL herbicide, is being introduced for commercial use in a few cotton areas this year. When using any formulation of "Karmex" herbicide on crops, label directions should be followed carefully.

THE RUSSIAN PEASANT AND THE SOVIET FOOD SUPPLY

The Russian peasant and the communist government are not pulling very well in double-harness. While urban members of the Communist party have apparently been successfully "collectivized," the Soviet farmer shares the desire of farm folks everywhere to have at least a little land of his own, a cow of his own to milk, and a home for his family rather than just an apartment within bus distance of fields where he must labor for the government.

This decidedly uncommunistic attitude on the part of the peasants is creating quite a problem for the folks in the Kremlin, according to the report of Thomas P. Whitney, Russian specialist for the Associated Press, in a recent issue of the "New York Times Magazine." He mentions specifically two situations which indicate the seriousness of that problem:

(1) The U.S.S.R. has been consuming more grain than it has been harvesting. The government is being forced to make withdrawals from vital grain reserves maintained as a safeguard against famine in case of drought or war. It is doubtful whether Russia today harvests more grain than before collectivization 25 years ago, Mr. Whitney states, in the face of great population increases.

(2) Since 1928 the population has grown by tens of millions, but the number of cows has declined by ten million. There have been similar slumps in other classes of livestock. This has produced shortages of milk, butter, meat, and other livestock products, and an industrial shortage of leather, wool, and the like.

A typical Soviet peasant is pictured by Mr. Whitney. He lives in an unpainted log cabin built 50 years ago. Once thatched, the roof is now covered with tin. The walls are tight and a large old wood stove keeps the interior comfortable during winter. There is no electricity and the water comes from a community well several houses away.

Around this house is a family garden plot of about an acre and a half, on which the vegetable and fruit requirements of the family are produced, and from which a little produce is left over to sell. There is a family cow to provide milk and butter and a calf for butchering in the fall, and a family sow that produces an annual litter (sometimes two) from which one pig is butchered for family consumption while the others are sold.

This farm home is on a collective farm of about 4,000 acres, which employs nearly 1,500 people. All able-bodied members of the family are required to work on the farm. Mr. Whitney calls his typical peasant "Andrei" and has this to say about the farmer's reaction to collectivism:

"Andrei has his own specific attitude about the work he does on the collective fields. He is not stupid and sees that almost all the produce ends up in the hands of the government. There are

large compulsory deliveries to the state and payments to the Machinery and Tractor Station (which plows the land with its tractors and harvests with its combines). These take more than half the farm's grain crop.

"There are allotments to a farm fund for seed for the next year and also for a crop reserve. The local Communist party boss is always coming back, even after the compulsory deliveries have been met in full, for more and more.

"Andrei and his family know ahead of time that they are going to get very small return for working on the collectivized fields.

"Naturally this conditions their attitude. They are constantly on a sort of slow-down strike when they can avoid risk. The verbal whiplashings which they occasionally receive from the collective farm chairman, who is a "foreigner" (from several hundred miles away) are lost against their peasant stubbornness and cleverness. They listen meekly and go on doing just as they did before.

"On their own plot they are the very picture of concentrated energy. When Andrei dreams of what he would like, it is always in terms of twice as large a private plot and two cows instead of one."

But Soviet leaders are, in the main, not of peasant origin. They have no sympathy for the peasant craving for land. It is anti-communistic. They paint pictures of lifting the farmer above the rank of "peasant" and of making him an "agricultural worker" receiving wages instead of produce for his work, living in apartments, and purchasing his food in stores or restaurants.

So far the peasants have been able to stubbornly hold their own against this philosophy. One attempt on the part of the government to make the farmer more a subject of the state resulted in the present Russian livestock shortage. A move was made to ban the private ownership of cattle on collective farms. But instead of peacefully turning their livestock over to the communist boss, many peasants simply slaughtered them. As a result, livestock numbers dropped off to the point where last August the government decided to not only permit private ownership, but to encourage it.

Today the Communist party, faced with a food shortage on one hand and the lethargy of peasants on the other, is making its strongest bid to break the agricultural deadlock. Two massive programs have been launched:

(1) Almost 200,000 agronomists, engineers, mechanics, executives, and party bosses have been dispatched to the 9,000 machine and tractor stations which control all farm machinery. They are instructed to increase agricultural output, and to break up the passive resistance of the peasants.

(2) An army of 100,000 young men and women of the Young Communist Youth League is being sent to semi-arid sections in

Central Asia, the Volga, southern Ural mountains, and Siberian plains. Their task is to put 32,000,000 acres of virgin land into grain production. This is a total area equal to the size of New York State, in locations where droughts are frequent. The plan sounds like a Soviet dust bowl in the making.

"If the Kremlin had been one-tenth as successful in producing food as it has been in producing plans for producing food, Russia would have no problem," Mr. Whitney points out. "These previous plans have all been buried in the Russian sod by the peasants themselves. It is a mistake to underestimate their tenacity and stubbornness."

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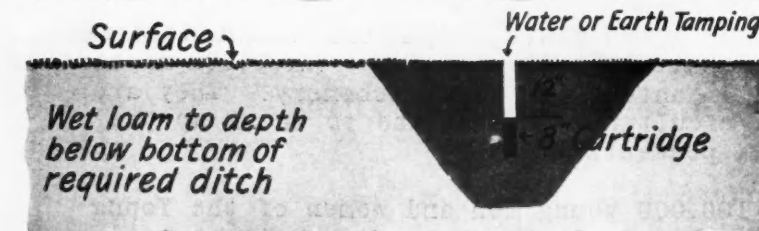
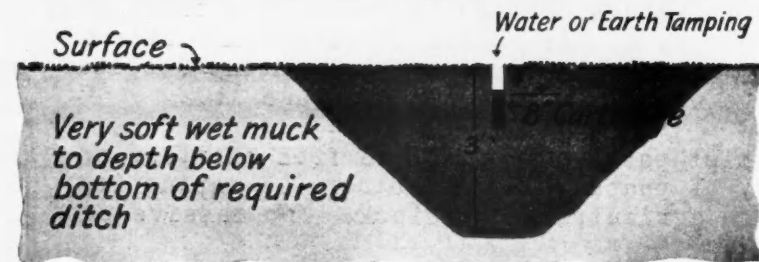
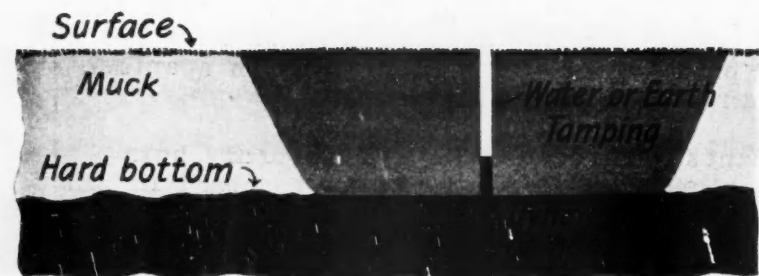
DYNAMITE STILL EFFECTIVE TOOL

FOR DITCHING, CLEARING FIELDS

"There is no reason to fear dynamite, but it must be respected."

Just how to pay your proper respects to dynamite, and how to use it most effectively in agricultural ditching, pond construction, and the clearing of stumps and boulders from fields has been the theme of a long-time educational program carried on by the Explosives Department

of the Du Pont Company.



While the bulldozer and other modern heavy equipment have replaced the practice of blasting to accomplish many farm land clearing and drainage jobs, under certain circumstances dynamite may prove the most effective and most economical tool for the work at hand. In ditching, particularly, use of explosives is often preferred since no large soil pile is left along the ditch bank.

While blasting is one of the oldest practices known to agriculture -- virtually the most important tool to

be used in clearing new farm lands as our population moved westward -- many a neat trick has been developed over the past years in making the explosive charge do its work better. An example of the know-how of blasting which has resulted in streamlining the job is seen in the diagrams on the opposite page, illustrating the placing of charges depending on the type of soil encountered.

Similar techniques have been worked out for the blasting of stumps which are too heavily rooted to be pulled by machine and the breaking of boulders which are too large to be removed in one piece.

The proper handling of blasting caps can eliminate what is perhaps the most serious hazard in the farm use of explosives. Children and blasting caps are a dangerous combination. A close count should be kept on the caps left in the box after a charge is prepared, to be sure no unexploded caps have been accidentally dropped. And the blasting cap box should be kept in a safe place, preferably under lock, where inquisitive youngsters will not get at it.

With emphasis on both safety and efficiency in the blasting job, the Du Pont Company has prepared a profusely illustrated booklet entitled "Ditching and Field Clearing with Dynamite." County agents or others who frequently advise on the use of explosives may secure a copy for their reference library through a request addressed to the editor of AGRICULTURAL NEWS LETTER, Du Pont Company, Wilmington 98, Delaware.

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* * * * *

* TREES GROW BETTER IN UPSIDE-DOWN SOIL *

* * * * *

* Two Connecticut research workers have determined that *

* tree growth can be speeded up by literally turning the ground *

* upside-down. They grew hybrid poplar cuttings and rooted *

* white pines in large steel cylinders where the topsoil was *

* placed at the bottom and the subsoil put on the surface, and *

* got twice the growth in the case of the poplars and a small *

* increase in the pines, compared with similar trees grown in *

* the cylinders with the soil arranged in normal fashion. *

* * * * *

* Why? Well, the fertile topsoil at the bottom tended *

* to remain constantly moist and roots reaching down into it *

* could extract the nutrients necessary for growth more easily, *

* they reasoned. Also, the subsoil, which was now on the sur- *

* face, contained practically no weed seeds, so weed competi- *

* tion was virtually eliminated. *

* * * * *

TREATMENT AND PREVENTION OF KETOSIS IN DAIRY CATTLE
THROUGH THE USE OF SODIUM PROPIONATE

By Dr. L. H. Schultz*
Department of Animal Husbandry
Cornell University

A brief review of the work leading up to the use of propionates for ketosis control might be desirable. The observation that the only farm animals in which ketosis (sometimes called acetonemia) is a practical problem are ruminants (cows, sheep, goats) led to a study of the role of the rumen in the development of this condition.

In 1945 English workers had identified acetic, propionic, and butyric acids as important products of bacterial action in the rumen and had suggested that they supplied a significant portion of the energy needs of the animal. Therefore, the amounts of these fatty acids in the rumen of cows at the time of ketosis were compared to the amounts present in the same cows after recovery. It was found that the level of all three acids was low at the time of ketosis. There was also a change in the proportion of acids in the direction of higher acetic and lower propionic.

Another approach was to inject each acid into the rumen of normal goats and follow the changes in blood sugar and ketones. In ketosis, blood sugar is low and blood ketones are high. After injection of acetic acid, there was no marked change in the blood picture. After injection of propionic acid, there was a very marked increase in blood sugar and no change in ketones. With butyric acid, there was a marked increase in ketones, and, after an initial rise, a decrease in blood sugar. These results suggested that excess production of propionic acid in the rumen would be desirable, while excess butyric might be undesirable from the standpoint of ketosis.

Sodium Propionates for Treatment

The above work led to the use of the propionate salts for the treatment of ketosis. During the past three years, a total of 37 cases of ketosis in five herds have been treated under our supervision. Thirty-three of these were considered to be uncomplicated ketosis and were treated with sodium or calcium propionate as the only treatment, with satisfactory response. Four cases were complicated with other things such as uterine infections, cystic ovaries, and mastitis. Two of these were also given glucose. Although these four animals finally recovered, response was slow. In the whole group there were four relapses, which responded satisfactorily to a second treatment.

The sodium propionate, a white powder, was given orally twice a day either by drench, capsule, or in the grain. Drenching was the usual method for the more severe cases because usually they were not eating much grain. The usual dosage level was one-half pound per day (one-quarter pound night and morning) for a period of five to 10 days depending upon response. Some of the milder cases were

treated for longer periods at lower levels by feeding the propionate in the grain. Obviously, this is the simplest method if we can obtain sufficient intakes. Progress is being made in improving the palatability of sodium propionate by pelleting in part of the grain mix or by the addition of small amounts of other substances.

Sodium Propionate for Prevention

The fact that sodium propionate could be given orally introduced the possibility that ketosis might be prevented by feeding it at low levels during the ketosis susceptible period, or that the milder cases of ketosis might be treated by simply feeding a concentrate mixture containing propionate. Therefore, an experiment was set up to check this point. It is now in its third year. Cows in three herds are paired up as evenly as possible on the basis of age, production, time of calving, and previous history of ketosis. Within each herd, all cows are fed the same type of roughage and grain mix. Grain is fed according to production. One member of each pair receives one-quarter pound per day of sodium propionate for a period of six weeks, starting at calving. The other member of the pair serves as a control.

Information was presented on the first 17 pairs at the 1953 American Dairy Science Association Meetings. Up to that time, three cows in the control group showed sufficient symptoms of ketosis to require treatment, while none required treatment in the propionate-fed group. There was an advantage for the propionate-fed group in terms of higher milk production, higher blood sugar levels, and lower blood ketone levels in samples taken one, three, and five weeks after calving, but these differences were not statistically significant. In terms of minimum blood sugar and maximum blood ketone levels recorded, there was a significant difference in favor of the propionate-fed animals. This experiment is continuing with 35 pairs completed at present. The trends are the same, and at this writing, a total of seven cows in the control group and none in the propionate-fed group have required treatment for ketosis. All cases which developed in the control group were treated with propionates alone.

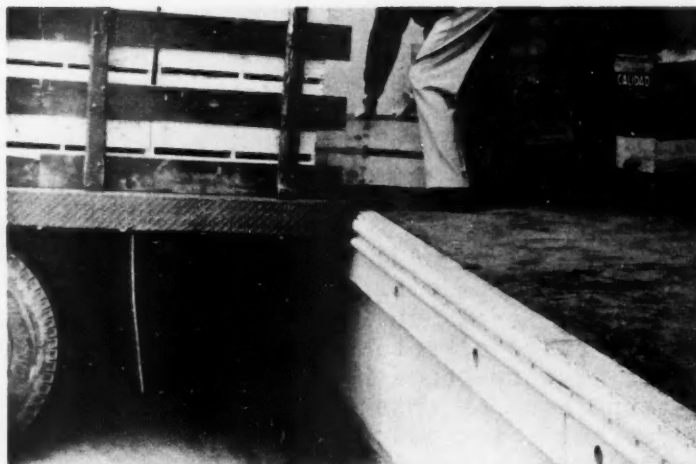
At this point it might be well to mention that our ketosis research was set up to find out more about the basic cause of ketosis with the hope that some day it might be possible to tell dairymen how to control it without the use of drugs. The idea of the use of sodium propionate for ketosis control came as a by-product of this basic research, and it seemed desirable to determine the practical value of this material in the field. This is being done. However, the basic research is still continuing. Progress is necessarily slow because the basic cause of ketosis is still not well understood, and it cannot be produced experimentally with any consistency.

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* The above article is condensed from a report by Dr. Schultz which appeared in a recent issue of the magazine FEEDSTUFFS.

SAVE ON REPAIRING LOADING PLATFORMS

How often does that plank on the front of your truck loading platform have to be replaced due to the cracking, splintering impacts of hurried operations? Much of this damage can be halted with a new bumper guard of neoprene rubber, being introduced by a California firm. Dented rear fenders and chipped paint on trucks can also be avoided with the same protective strip.



Here's a truck loading dock on which the new heavy-duty bumper strips made of neoprene have been installed. They protect against damage to both facing boards on the platform and trucks.

Neoprene was used in this case to assure long life under rugged service, since the synthetic rubber is highly resistant to abrasion and tear, as well as to the rubber-deteriorating effects of sunlight, weather, oils, greases, acids, and other chemicals.

The bumper guard comes in 14-foot sections. Outwardly it looks like half-round molding on a wide, flat base. Actually, it is hollow with inner webs to provide the necessary amount of "bounce" on impact. It can be nailed on the facing board of the truck platform with ordinary roofing nails. A double strip, as shown in the photo, gives added protection.

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NEW FLASHLIGHT CASE IS WATERPROOF, DROP-PROOF

Ever suffer from flashlight failure because the batteries got wet? Ever drop your flashlight and either break the case or, if it was of metal, dent it so the batteries would not fit?



This is the tough, waterproof new flashlight case.

A Chicago firm of plastics molders is now producing a flashlight case which is waterproof, lightweight, and so tough they guarantee it unconditionally against breakage. The case is molded of "Alathon" polyethylene resin, a rigid, heavy-duty form of the same material now used for packaging of many fresh fruits and vegetables for self-service super markets. The case locks out moisture so well, they report, that batteries and contacts are unaffected, even when the flashlight is submerged.

#####

NEW SEED DISINFECTANTS

IN LIQUID FORMULATIONS

To treat small grains, two new liquid seed disinfectants have been announced by the Du Pont Company.

Both the formulations are based on a combination of phenyl mercury acetate and ethyl mercury acetate and are intended for use with wheat, rye, barley, oats, flax, and other similar grain crops. Experimental work starting in greenhouse and test plot evaluations and carrying through to commercial use in spring wheat areas in Minnesota, the Dakotas, and Montana, preceded introduction of the new disinfectants.

One of the new products, Du Pont Liquid 364, is a concentrate for dilution with water and use in slurry treaters. The other, Du Pont Liquid 244, is to be used undiluted in ready-mix (completely automatic) seed treating equipment. Like other Du Pont seed disinfectants, the new products control certain soil-borne and seed-borne diseases and improve stands by preventing seed decay and reducing seedling blights.

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DANGER OF OVER-EXPOSURE TO CERTAIN

INSECTICIDES CHECKED BY RAPID TEST

Cholinesterase is a vital body enzyme which must be kept in balance to insure normal activities of the organs and nervous system. Certain organic phosphorus insecticides inhibit the activity of this enzyme in insects and it has been found that over-exposure to these materials may produce similar effects in humans.

Symptoms of a lowered cholinesterase level in the body may manifest themselves in nausea, diarrhea, headache, a feeling of weakness, or muscular twitching. However, such symptoms are non-specific and may indicate a slight case of sunstroke, or digestive disturbance, as well as the insidious action of the insecticide.

Serious illnesses and a few fatalities have resulted from careless handling of the more potent organic phosphates. Anyone applying these materials who experiences the above symptoms should immediately undergo medical examination. Since cholinesterase appears in the blood stream, a blood test designed to measure the amount of the enzyme present can be used to establish the diagnosis.

In the past, such an examination could only be conducted with complicated laboratory equipment and ordinarily a day or more was required for a report on such a test. Now, however, a new test kit to check cholinesterase activity is available for on-the-spot checking by doctors, nurses, or laboratory technicians. This enables the farmer, or members of his spray crew, to know within minutes after

the blood sample is taken whether insecticide-exposure is the cause of his discomfort.

This test was developed by George Limperos and K. E. Ranta, two biological research scientists in the Du Pont Company's Haskell Laboratory for Industrial Medicine and Toxicology. The method was published in "Science Magazine" (April 24, 1953, pp. 453-455) and made available to medical circles as another step in safeguarding users of these important new insecticidal compounds. Since the test kit employing this method, now offered for sale by a private manufacturer, provides both quick and inexpensive tests, it is hoped that routine, frequent blood testing of all personnel working with such compounds will become an established practice wherever such materials are manufactured or applied.

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NYLON SHEATHED CABLES WARN

WHERE STORED GRAIN OVERHEATS

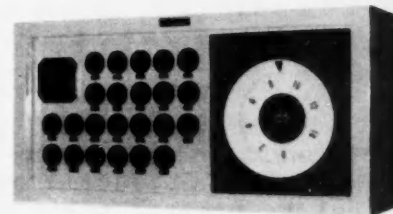
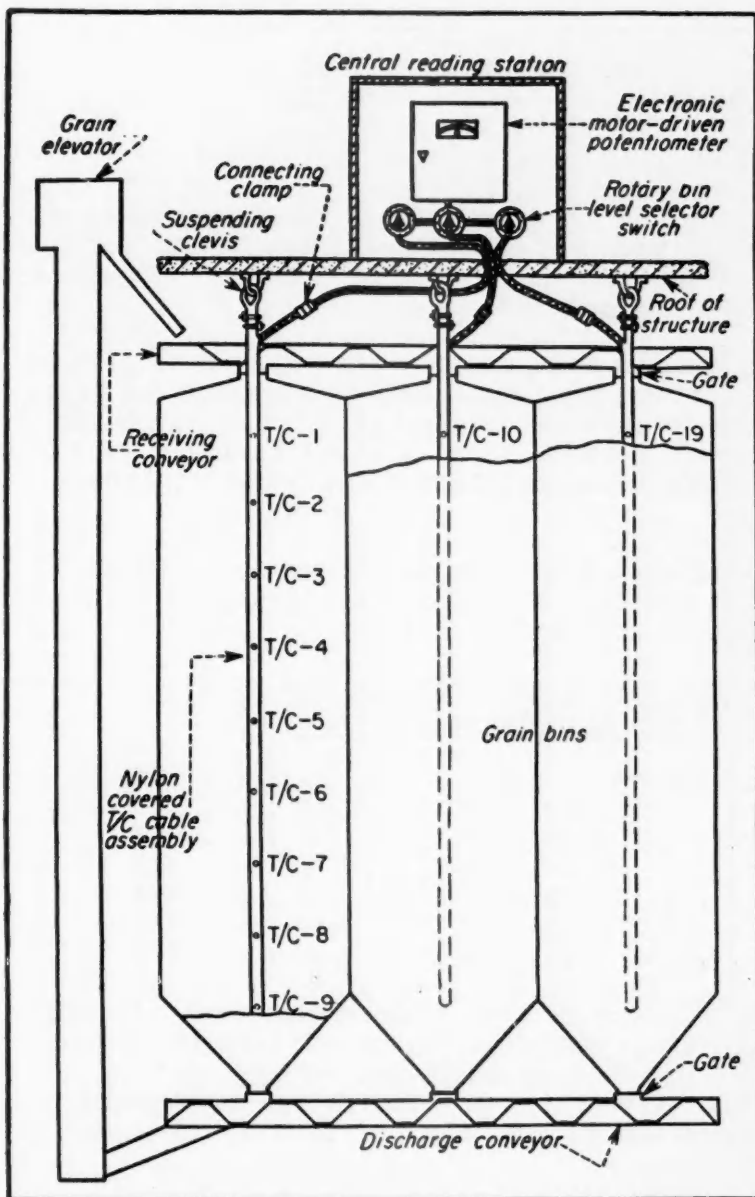
Insect damage to stored grain may vary from five to 10 per cent in the Central Plains states to as much as 50 per cent in the Gulf Coast states. In dollars, this amounts to between \$300,000,000 and \$500,000,000 annually on a national basis.

Insect infestation, mold growth, sprouting, and the presence of moisture, dirt and chaff pockets all contribute to increased temperatures in the bin. For some time it has been recognized that the ability to locate such temperature rises at the time they occur would provide a valuable warning of trouble in any storage area. Given such a warning, the contents of the bin could be turned before damage became too widespread.

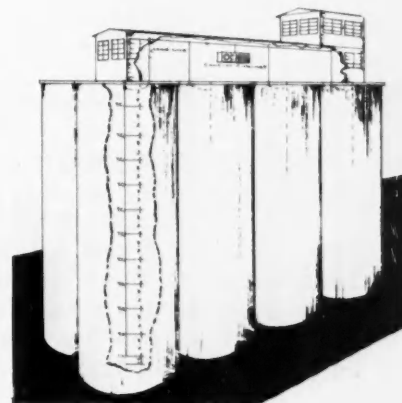
In some storage installations temperature measuring devices have been put in the bins. Generally, these have made use of thermocouple wires, to indicate temperature changes at given points on electrically operated instrument panels.

Originally, these wires were suspended within steel pipes centered in storage bins. Even heavy-duty pipe, however, curled and broke under the tremendous pressures exerted by the grain itself. As a remedy, flexible cables protected by braided metal armor were tried. These cables, which yielded to the weight of the grain, were more effective than solid pipe. However grains such as corn and soybeans were sufficiently abrasive to cut through the braided armor of heavy-duty stainless steel.

The solution to these problems was found in a cable sheathed in extruded Du Pont "Zytel" nylon resin. This cable, an adaptation of one used for marine towing, was made of strong steel wires and thermocouple wires embedded in "Zytel." The entire cable was then cased in "Zytel" for further protection. Tested in a 90-foot bin, the cable easily met a 7,500-pound load test. Further, the smooth, resilient "Zytel" was unscarred during tests approximating four



The diagram at left shows the manner in which cable sheathed in "Zytel" nylon resin is used to record temperatures in grain bins. The photo above shows a control instrument used for such systems. The large dial switch at the upper left is the master selector switch with which the operator selects the grain bin in which temperatures are to be scanned. After selecting the bin, the operator moves to the smaller round switches, through which he connects the instrument to the thermocouples, or reading stations, within that particular bin. The diagram below shows relative location of the control station in a typical grouping of storage bins.



years of hard use. In addition, the "Zytel" protected the metal of the cable from any corrosive atmospheric conditions.

Already widely in use, the system employing the cable covered with "Zytel" provides readings for multiple temperature check points in a remarkably short time. The 180 temperature points which might be expected, for example, in a 10-bin installation can be checked in less than four minutes daily. Such a short period of checking can result in enormous savings through the turning of grain before spoilage becomes too extensive.

#####

CORN SEED TREATMENT -- WHAT'S IT WORTH?*

By Dr. Carl W. Boothroyd
Department of Plant Pathology
Cornell University

Surface treatment of corn seed with a thin layer of chemical to protect against soil- and seed-borne pests has become routine procedure. What is it worth to the New York state farmer -- in terms of net gain on his original investment?

Such a question can be more readily answered if we go back to the cost of producing corn on the farm. Although production costs necessarily vary from farm to farm, a reasonable average may be obtained from farm cost account records such as those compiled by the Department of Agricultural Economics at Cornell University, Ithaca, New York.

The following tabulation was prepared from information of this kind obtained for 539 acres of corn for grain grown on 26 New York state farms in 1951:

Average percentage cost of producing one acre of corn for grain in New York, 1951.

Interest on investment.	3%
Seed.	4%
Storage	6%
Land.	11%
Fertilizer.	24%
Labor	25%
Equipment	27%

It is immediately apparent that the average cost of corn seed for one acre is small (four per cent) compared with the other items. Even more dramatic is the very small percentage cost of treating that seed. If that cost were computed on the same basis as the other items in the above table, treatment of seed would amount to only 0.14 per cent.

What is the cost of this treatment in dollars and cents? First, we will have to assume that all of the seed on these farms was treated. Furthermore, we will say that just one commonly used chemical protectant combination was employed, "Arasan" seed disinfectant as a fungicide plus lindane as an insecticide.** Current market prices of these chemicals plus an estimated 50 per cent more for operational costs would add up to about 35 cents per bushel for treatment.

*Adapted from a paper presented at the recent Cornell Seed School, Ithaca, New York.

**These two chemicals, blended in proper proportions for seed treating, may be obtained as Du Pont I & D (insect and disease) Seed Protectant.

The cost of seed for one acre on the above cost account farms was \$2.04. At 35 cents per bushel for treating, the cost of treating enough corn seed for a single acre would amount to only seven cents.

What is the return on this infinitesimally small investment for seed treatment? We have little information on the actual increase in bushels per acre from treating corn seed in New York state. There have been many reports of poor stands of corn, and investigations have revealed up to 50 per cent seed decay and seedling blight from wireworm damage, seed-corn maggot injury, and fungus rots. The yield of corn on such acreages was undoubtedly reduced. Much if not all of this loss might have been avoided if the seed had been properly treated with a surface chemical before planting.

Other corn-producing states have estimated average increases from seed treatment ranging from four to eight bushels per acre for the 1953 growing season. An estimate of about five bushels increase per acre for New York state would seem conservative. Even at this rate, with a corn harvest valued at about \$1.75 per bushel, the average net gain per acre would be almost \$10.

Although several assumptions have had to be made in the above story of seed treatment, and many details have been purposely omitted, one fact stands out clearly. Expenditure of only a few cents for a corn seed protectant may put dollars in the farmer's pocket.

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WHATEVER YOU DO, BE CAREFUL!

Did you ever think of farming as a hazardous occupation? Below is the box score of 1953 occupational accidents and deaths, according to industrial groups:

Industry group	Total	DEATHS	Total	ALL INJURIES ¹
		Per 100,000 workers		Per 100,000 workers
Trade	1,400	12	360,000	3,120
Service	2,300	16	380,000	2,610
Manufacturing	2,400	14	480,000	2,810
Public utilities	300	22	19,000	1,400
Transportation	1,400	44	190,000	6,030
Agriculture	3,800	59	320,000	5,000
Construction	2,500	81	220,000	7,100
Mining, quarrying, oil and gas wells	900	107	60,000	7,140
Total	15,000	Avg. 26	Total 2,029,000	Avg. 3,450

¹ Includes deaths.

The removal of hazards and avoidance of risks around their homes and farms is a personal project which America's rural population must undertake to cut down this awful toll.

PACKAGING POULTRY FOR SELF-SERVICE

BUYERS VITAL STEP TO GREATER SALES

If poultry is to compete with other meats for its share of the consumer's food dollar, it must go to market in packages that are both attractive to the housewife and practical from the standpoint of keeping the product fresh and appetizing.

This is the advice which has been passed on at recent meetings of poultry industry groups by packaging experts of the Du Pont Company's Film Department. Their information stems from a series of studies of buying habits of shoppers in super markets throughout the country.

With thousands of items to select from in modern markets, and shopping time at a premium, few women will wait five minutes for a butcher to dress a chicken, the consumer surveys showed. As an example, it was pointed out that, where self-service meat departments have been introduced, shoppers purchased more products in half the time it took the same number of shoppers to complete purchases at regular meat counters. This is largely due to the elimination of traffic bottlenecks such as waiting in line for cutting, weighing, and wrapping.

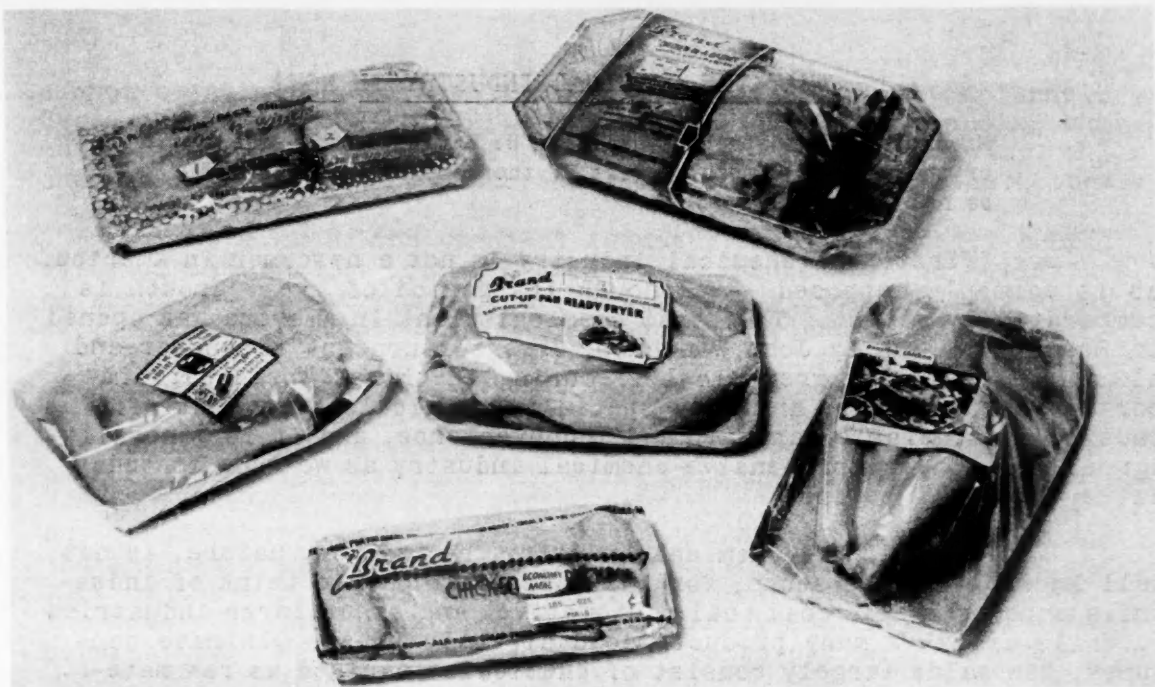
Among hundreds of food store shoppers covered in a recent spot check, 50 per cent purchased luncheon meats, 70 per cent bought fresh meat, but only nine per cent bought fresh poultry, one per cent purchased frozen poultry, and one-half of one per cent took home canned poultry. The processors who report successful sales of poultry are mainly those who have improved both their packaging and merchandising techniques to meet modern demands.

They have found that the housewife wants poultry neatly packed in a transparent wrap, so she can see what it looks like. She wants it readily available in the market, with the weight and price clearly marked on the package. Also, brand names on the packages are beginning to attract attention since they help identify the processor. Twenty years ago women just bought chicken, but today more and more shoppers want to know whose poultry they're buying and demand products which have proven satisfactory.

Experimental work in poultry packaging has shown that a semi-moistureproof cellophane with some perforations is best for fresh poultry packaging for these reasons:

(1) Fresh poultry tends to slime and mold in a fully moistureproof film during its normal two or three days of shelf life.

(2) Odors tend to build up in fresh poultry packaged in highly moistureproof and gasproof films over a two or three day period. Although these odors may not indicate spoilage, they are often



These are the types of self-service packages which surveys show will sell more poultry meats in modern super-markets.

offensive to customers. By perforating the semi-moistureproof cellophane with two or three quarter-inch holes, this problem is overcome.

However, packaging is no substitute for proper refrigeration. If packaged within 24 hours after processing, fresh poultry can be held in a refrigerated display case for two or three days at temperatures between 32°F. and 38°F.

In the field of frozen poultry meat, packaging with tough, flexible polyethylene film is the approved technique. In the matter of brand names, this material can be imprinted with the packer's brand along with cooking instructions, and can be taken from the retail display cabinet and placed in the home freezer or refrigerator freezing compartment with no rewrapping in special materials necessary. Among other characteristics which make polyethylene film ideal for packaging frozen poultry are:

- (1) A high degree of moistureproofness to prevent dehydration and subsequent freezer burn.
- (2) A high degree of gasproofness, to minimize oxidation resulting in off-flavors, off-odors, appearance changes, etc.
- (3) Ability to withstand storage at temperatures as low as -70°F. for long periods without breaking and cracking, which would result in dehydration and oxidation. For the same reasons, polyethylene's flexibility and good wrapper "cling" are important, since these qualities eliminate the presence of air pockets.

Modern methods of both packaging and refrigeration, recent studies indicate, can combine to make both chicken and turkey a much more popular item on the American dinner table than it has been in recent years.

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WHAT THE CHEMICAL INDUSTRY IS NOT!

Excerpts from a speech by William H. Ward, vice president of the Du Pont Company. Text of the complete address may be had on request.

"First, the chemical industry is not a newcomer in America as is commonly supposed -- although its period of great growth is comparatively recent. The first chemical plant in America was opened in Boston in 1635 by John Winthrop, Jr., to turn out saltpeter and alum...The industry grew slowly...During the First World War, imports of drugs, dyes, and many specialty chemicals were shut off, causing considerable hardship and inconvenience, and it is generally agreed that the comprehensive chemical industry as we know it today dates from this period.

"Second, the chemical industry, by its very nature, is not well known -- in the sense, for instance, that people think of industries such as steel, coal, oil, automotive, and other large industries ...While it makes many products sold directly to the ultimate consumer, its sales largely consist of chemicals required as raw materials or in the manufacturing processes of other industries. In fact, chemicals and allied products is the only group in the 72 industrial classifications of the United States Department of Commerce which supplies products to every other group."

"Third, the chemical industry is not a despoiler of our native raw materials. On the contrary, the findings of its research have had the practical effect of conserving our supplies of vital raw materials...Agricultural chemicals and plant food, fumigants to protect stored crops, and chemical aids to the preserver and processor have been estimated to increase the quantity of food that reaches the ultimate consumer by as much as one third. Products of chemical research have saved millions of dollars in growing non-food crops, such as cotton."

"Fourth, the chemical industry is not close to exhausting its research possibilities. The scientists tell us that the number of new chemicals which can be produced is almost infinite, and the research laboratories develop about 10,000 every year. Most of them find no immediate commercial use -- but others open up new avenues of industry."

"Fifth, the chemical industry is not a monopoly industry. There are more than 9,000 chemical establishments in this country, most of them small, but including at least 27 with assets of more than one hundred million dollars. The sales of the largest chemical company -- Du Pont -- represent only 8.5 per cent of the industry total. There are 16 major competitors in plastics, 19 in sulphuric acid, 50 in coated fabrics, 4 in photo products, 15 in explosives, 117 in anti-freezes, 1200 in paint -- and so forth...There are dozens of fertilizers, pesticides, and fungicides competing for the farmer's business."

"Sixth, the chemical industry is not static...The industry

cannot stand still, because in some respects it is like a funnel. Research and innovation, which are the industry's outstanding characteristics, pour in new products and new processes at the top, while chemicals and processes rendered obsolete drain out at the bottom."

"Seventh, the chemical industry is not the chief beneficiary of the new and improved products developed by the research on which the industry spends a quarter of a billion dollars annually. The real gainer is the individual American citizen. Countless lives have been saved and many diseases conquered by products of chemical research...There are the synthetic textiles which have contributed so much to easy living -- but cotton remains king of the textiles, partly because of its natural qualities, but also because chemicals fertilize the soil, kill the weeds, size the yarn, bleach the cloth, and give cotton fabrics advantages unknown to our grandmothers. Chemicals produced the detergents required by the automatic washers and dishwashers which relieve our wives of much of their old household drudgery. Chemicals helped produce the heat-resistant metals for jet airplanes, and the fuel which powers them. Without chemical insulation we couldn't have the widespread advantages of electricity."

Eighth, "the chemical industry is not an independent industry -- one which can stand alone -- but rather one which is an integral part of America's vast industrial picture, a part of a closely integrated group of industries whose activities interlock like a jig saw puzzle, each piece depending upon all the others to accomplish its purpose. Only when the pieces are all in place does the picture emerge. We in industry know that our march of progress will require an environment which encourages us to push forward. The essential ingredients of such an environment are freedom and understanding."

Ninth, "the chemical industry is not able to carry on the battle for understanding alone...In the world as it is, restless and uneasy, the winning of understanding is a task that challenges the efforts of all industry...Our enemies know well the importance of productive capacity in the world today, and against American industry they have sought to bring two powerful weapons -- ignorance and lack of understanding. The American people must recognize the true source of their economic security and the part that industry plays in it. Unless they guide their efforts so that this security can be cultivated and protected, they are in peril of defeating their own ends."

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DON'T GET STUNG! If hornets or yellow jackets build a nest around the house or barn, you can remove this hazard by plugging the opening with a wad of cotton soaked in carbon tetrachloride (which slows down their activity), dislodging the entire nest into a paper sack, and burning or burying it, sack and all. Wasps can be put out of commission with a dose of DDT or chlordane applied directly on nest openings. Better do these deeds at night, warn USDA entomologists, when the insects are less active and most likely to be in the nest.

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EXPERIMENTERS' NOTATIONS

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A Round-up of Data from Across the Nation

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New uses for "Manzate" fungicide (manganese ethylene bis-dithiocarbamate) are being reported by experimenters throughout the country. On Long Island, Dr. Robert Cetas, plant pathologist at the Long Island vegetable research farm, has found "Manzate" to be superior to other materials as either a dip or dust to control seed piece decay of seed potatoes. His work points to use of 1.2 ounces per bushel of a 10 per cent active dust as the most practical application. A large canning company compared results from the use of several fungicides for control of alternaria blight of carrots. Tests in New Jersey and eastern Pennsylvania showed yield increases of seven to eight tons per acre where "Manzate" was applied.

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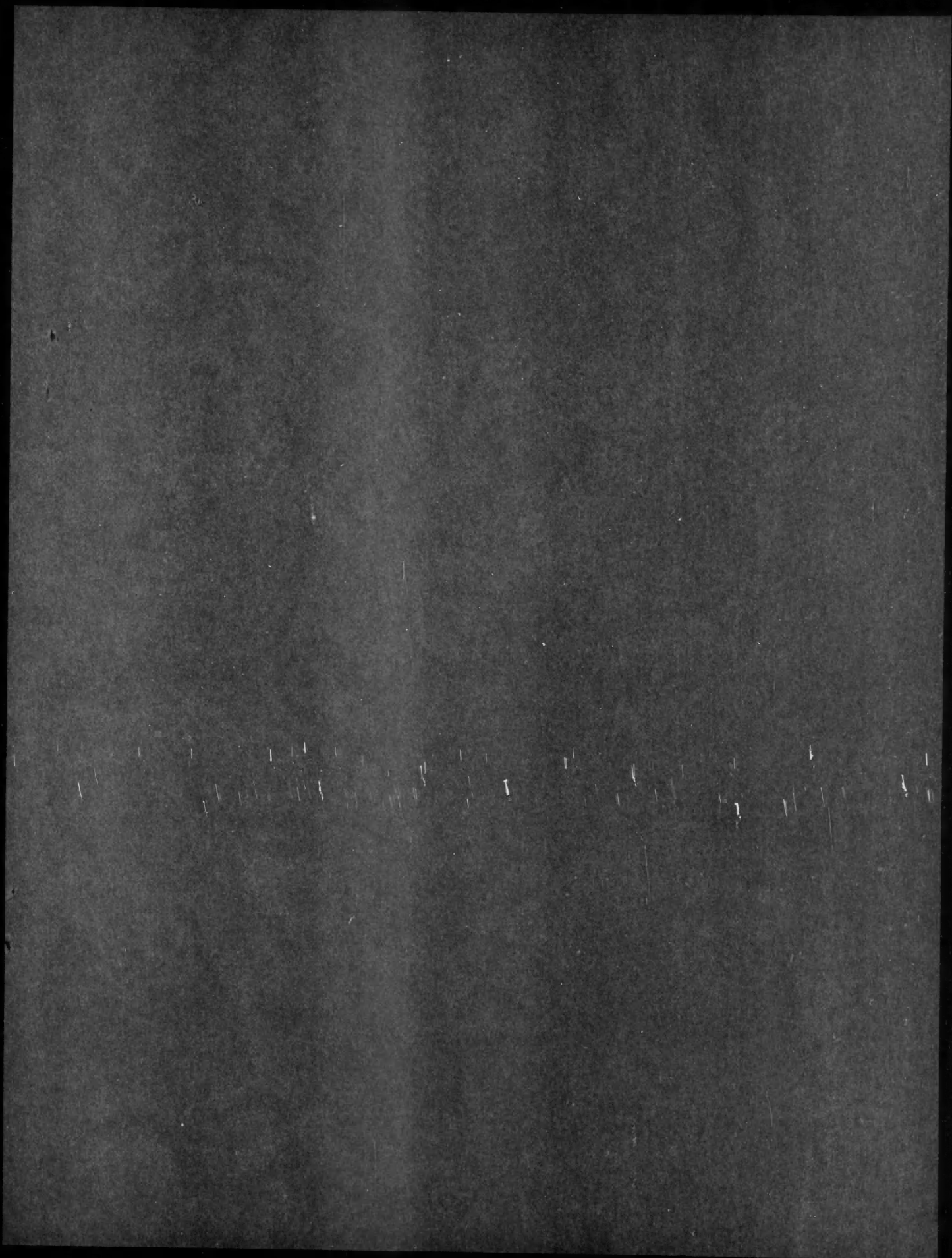
Pea seed is expensive and chemical seed treatments have aided in economizing on seed by increasing field stands by as much as 50 per cent, as compared with untreated seed, according to a report from New York State Agricultural Experiment Station. This report pertains to use of a fungicide only. Recent tests using a combination fungicide-insecticide treatment ("Arasan" seed disinfectant plus lindane), to control seed corn maggot as well as soil-borne diseases, shows an even greater increase in stand in many areas.

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To check the safety factor when methoxychlor is sprayed on forage crops intended for dairy cattle feed, USDA experimenters fed alfalfa hay containing residues of the insecticide ranging from 16 to 109 parts per million to milking cows for periods of 40 to 80 days. The milk was analyzed at 10-day intervals and no methoxychlor could be detected. Approximately 100 times as much methoxychlor as DDT must be fed before the insecticide becomes detectable in milk, it was declared.

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At Tallulah, Louisiana, USDA entomologists have compared yields from untreated cotton plots against plots treated for insect control every year since 1920. Some 973 plots have been involved over this 33-year period. Treated plots have yielded an average of 1,826 pounds of seed cotton per acre, against an average of 1,455 pounds in the untreated plots. This is an average of 371 pounds more cotton per acre per year, or a 25.5 per cent increase due to insecticide applications.





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